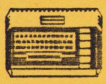
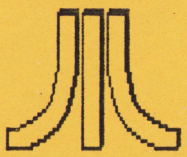
T — Y — N — E — & — W — E — A — R



TYNE & WEAR



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ISSUE #9

May/June 1994

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EDITORIAL

Who to blame!!!

John Matthewson
David Ewens
Max Gerum

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The next issue will be ready by mid-July.

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TIPS FOR OMNITREND'S UNIVERSE.

* StarPort + Dry Dock

Galaxy	#	Sys	Planet	Planet	Planet	Planet
Douglas	0	4	Sirrial*	Aueri ise	Miga kambut*	Feredkor
Phobos	1	3	Maelstrom	Schrelos*	Oba Autuahn	
Deimos	2	1	Diftalpa			
Ce Ent Calad	3	2	Pelador	Au Cassbo		
Zhisou	4	1	Benison*+			
Icharr	5	2	Beurn*	Cetus amicus*+		
Pyxis	6	4	Grotto*	Fevvel*	Bahnir*+	Myl*
Godel	7	3	S'Romoka	Austiberg	Thor	
Zworzykn's	8	0				
Kochab	9	2	Trygieve	Serendipity*+		
Hope	10	4	Axia*+	Philos	Gialia	Raya alba
Prisa	11	2	Ivilose*	Zeath*+		
Toascella	12	4	Hsiang Bao	Milokarr*	Jembamtouk	Rouv Chorra*
Vromus	13	4	Miunbieter	Kiskismok	Schnorr	Vromus prime*+
RCJ 2336B	14	1	Clyde			
Twain	15	2	Temblon	Stowe*		
Cyltios	16	0				
Nilock	17	3	Baines	Echawwa	Baliolsol	
Eros	18	3	Peschallia	Selpichuk	Arbest*+	
Evrytion	19	1	Aquiesca			

Landings.

Sand	Loose-Gravel	A-Seabed	Solid-Rock	Wet-Soil
Dense-Stone	Small-Rocks	Hills	Tundra	Dry-Lake
Wet-Soil	Small-Slopes	Homg-Rock	Stones	

SYS	PART	MAX	NAME
0	0 - 3	1	Hyper drive
1	4 - 10	1	Sub-light drive
2	11 - 13	1	Bridge
3	14 - 16	24	Accumulators
4	17 - 20	1	Convertor
5	21 - 22	1	Docking adaptor
6	23 - 26	1	Inertial cmpnst
7	27 - 29	1	Orbital scanner
8	30 - 35	1	Resource scanner
9	36 - 38	1	Hi-def scanner
10	39	20	Missile racks
11	40 - 42	1	Missile launcher
12	43 - 48	1	Laser
13	49 - 54	1	Shield
14	55 - 57	1	ECM
15	58 - 62	1	Assault craft
16	58 - 62	1	Assault craft
17	58 - 62	1	Assault craft
18	58 - 62	1	Assault craft
19	58 - 62	1	Assault craft
20	63 - 66	1	Ore processor
21	63 - 66	1	Ore processor

OMNITREND'S UNIVERSE continued.

22	63 - 66	1	Ore processor
23	63 - 66	1	Ore processor
24	63 - 66	1	Ore processor
25	67	1	Cargo hold
26	68 - 70	1	Vault
27	71 - 75	1	Orbital shuttle
28	71 - 75	1	Orbital shuttle
29	71 - 75	1	Orbital shuttle
30	71 - 75	1	Orbital shuttle
31	71 - 75	1	Orbital shuttle
32	76 - 78	1	Auto doctor
33	79 - 81	1	Ore storage
34	82 - 85	1	Crew quarters
35	86 - 87	1	Rescue pod
36	88 - 92	1	Computer
37	93 - 95	1	Mass storage

Planet		Orbit
SCHRELOS	*	4305
ARBEST	*	6090
IVILOSE	*	5355
ZEATH	*	6300
BEURN	*	4725
AXIA	*	6615
BENISON	*	6825

Just a few starport orbits above.

Would you like to stop the game from formatting your player disk every time something goes wrong, then get a sector editor, the problem lies on sector 64 on the starport and Flight 1 disks.

Sector	Byte	B1 - B1
64	76h	21h - 53h

I have used the letter 'h' for hexidecimal above. The '21' hex is the command to format, and '53' hex is the status command.
After this fix has been done all that will happen is the game will stop and no longer format your player disk, all you do then is reboot your flight 1 or starport disk and try again or get to the nearest dry-dock for more supplies, it only tries to format the disk when you come back from dry-dock and report or using an orbital shuttle that ran-out of fuel or was destroyed or lost.

Oh and one other little thing all the disks (Construction, Starport, Flight 1 & Flight 2) are only single density, not enhanced density.

I hope that this info will come in useful while playing Omnitrend's Universe.

Done and supplied by: Mr A. MCINTOSH 21 ROMAN ROAD, BONNYBRIDGE STIRLINGSHIRE, FK4 2DE, SCOTLAND

BANKING

Banking Made Easy or, Should You Use DEPOSIT Instead of POKE to Access Banked Memory?

by Anthony Ramos

You 130XE and RAMBO XL owners know how great those 16K memory banks are for a RAMdisk. They're also very handy when it's time to use Atariwriter Plus, and other software that uses them to your advantage. But what about when you want to roll up your sleeves and use them yourself? You can't just POKE around as though it's a contineous chunk of memory. The "hhh*LVd" disk reading string won't do the job either. But here's some information you can really bank on, from Mapping the Atari:

When a bank is opened for access, it appears through an "access window" in the main memory, at locations 16384-32767. If you enable bank switching, you cause the normal RAM in this area to be replaced by the bank you've chosen. You can configure the system to one of four modes: both processors using main memory, CPU (6502 main processor) using banked RAM, video (ANTIC) using banked RAM, or both using banked memory. In all cases, the only memory affected is the area 16384-32767.

In CPU extended RAM mode, only the CPU accesses the extra memory. All ANTIC cycles operate in the main 64K memory. This means you can use the extended memory for programs and data, while using the main bank for display lists and screen data.

In the video extended RAM mode, all ANTIC references to the area 16384-32767 will be directed to the secondary bank; all CPU references will occur in the main bank. This allows you to access the entire RAM memory for programs and data in the main area, while locating display lists and screen data in the secondary bank. In the general extended RAM mode, both the CPU and ANTIC process in the bank switched memory, and the main area in 16384-32767 is not used at all.

Location 54017 controls which bank is accessed, and by which processors. Default at powerup is both chips using main memory, or compatibility mode. To access the banks, POKE 54017 with 193+(Mode*16)+(Bank*4), with the modes and banks as follows:

Mode 0: both chips access banked memory; Mode 1: CPU accesses main memory, ANTIC accesses banked memory; Mode 2: CPU accesses banked memory, ANTIC accesses main memory; and Mode 3: both chips access main memory (Compatibility mode).

Bank 0: first bank;
Bank 1: second bank;
Bank 2: third bank; and
Bank 3: fourth bank.

An example: If you plan to use the banked memory for a character set, you must first load it in using the 6502 main processor. Poke 54017 with 193+16*2+0 to access bank one. Then use the familiar POKEs to 852-853 and 856-857 and "hhh*LVd" to load the set into the area 16384-32767.

Now POKE 54017 with 193+1*16 to make ANTIC access the banked area while the 6502 uses main memory as usual, and POKE 756, address/256 of your set. Make sure that any statement which affects location 54017 is not in the area 16384-32767, or the computer will crash. You can check the memory location of a BASIC statement with the line PRINT ADR(" "). The book "Mapping the Atari" goes into more detail.

If you don't want to get this involved, here are some machine language strings which give you the same power over the banks that you are accustomed to with the "straight" memory. Remember, though, that these commands will alter or completely erase the RAMdisk if present.

When you power up the computer, the banks are not clear, but full of garbage data. BCLEAR fills all four banks with zeros for a fresh start. BPOKE and BPEEK work like POKE and PEEK, except you access the banks like a continuous block of memory locations from 0-65535. These routines take care of the bank-switching location 54017, but they must not reside in the area 16384-32767. Put the lines at the top of your program and you will have no problem; type PRINT BPOKE, BPEEK, BCLEAR if you want to make sure. They can even be compiled, with one catch: under the TURBO BASIC compiler, the screen jitters when the banks are accessed.

From a technical standpoint, the 130XE has only twice the addressable memory of the older 800XL. But as a programmer, you actually have over three times more usable RAM. An Atari BASIC program which manipulates the extra 64K creates quite a powerful computing package. And you can take that to the bank.

HINTS & TIPS

TURBO BASIC

If you have to go to DOS when using Turbo Basic, instead of rebooting or loading AUTORUN.SYS, simply hit "M", then type "2080", and you'll zap right back into Turbo Basic.

ATARI 8-BIT GAME "KEY-CHEATS"

Some professional game programmers have built little key-tricks or so-called "EASTER EGGS" into their games. Here are a few key-tricks that you might enjoy trying:

AIR STRIKE II

If you're on you last life and about to die, press RESET and then press START. If you don't crash you will survive and carry on.

ARKANOID

Place something heavy on the SPACEBAR and the ball will slow down during play.

HINTS & TIPS continued

ATARI ARTIST

When on the main menu, position the cursor over the Atari logo, then press FIRE, and a little tune will play.

BASIL THE GREAT MOUSE

You need to collect the following objects:

LEVEL 1 - dagger, gun, cigar, flowers, and key.
LEVEL 2 - bone, hat, card, tooth, and fruit.
LEVEL 3 - letters, padlock, candle, cigar, and flowers.

BEER BELLY BURT'S BREW BIZ

Swim at the bottom of the pool in the production area to avoid the deadly fish.

BOUNTY BOB

Set the special code to 61800 and hold down the F key, and then press OPTION. Start the game. The option keys are:

Q = next screen
A = back 1 screen
B = original position
Z = reset screen
F = Bounty Bob floats

CANYON CLIMBER

If you complete the first screen and have lost any men, hold down the joystick button as the bridges are exploding, and then press START. On the next screen, you will have 3 new men.

CAVERNS OF MARS

On higher levels (like Commander) you can skip to the next section by pressing the Tab-Control & shift keys.

CONAN THE BARBARIAN

Press the T key on loading up to achieve immortality while playing.

CRYSTAL RAIDERS

Hold down the fire button and press START. Now you will be invincible.

DAWN RAIDER

Set a weight on the spacebar to slow down the action and make play easier.

DIAMOND MINE

The password is DIAMOND. Also try HID, BIG, and DIA.

DESPATCH RIDER

By driving into a skip on your bike it gives you another place to pick up a package.

DONKEY KONG JR

Press SHIFT while typing "BOOGA" to get you into a "cheat mode". Now press K and the crocs can't kill you. Press S to advance screens.

ENCOUNTER

Press the number of the wave you wish to go to (you must have reached that level first).

To deal with incoming missiles, get parallel with a column and then move backwards and wait for the missile to come into your sights and then blast it.

The blue light on the console indicates when a saucer is about to fire. To avoid being hit, simply move in any direction except towards or away from it.

In the tunnel only move if there is an asteroid directly in your sights; the others will go past you.

FIGHT NIGHT

During the bout against the Bronx Bomber, simply guard yourself well and throw a few punches. If you have more points at the end of round 3 than he does, he'll be knocked out.

FRED

On level 6, try to stay on the top platforms for as long as possible to receive many bonuses.

If you type in CHAOS first, then you can select the starting level by pressing 0 to 9.

THE EXTIRPATOR

Press the spacebar to switch between the fire modes.

F15 STRIKE EAGLE

Run out of jet fuel? Simply press A and glide along on a cushion of air. Holding down the afterburner key also works sometimes.

GALAXIAN

For infinite lives, start the game when your missile is ready and then press SELECT quickly. The game prompts "Game Over", but ignore it. You can still play.

GHOSTBUSTERS

Press SPACEBAR while on the title screen and tah tah, "GHOSTBUSTERS"!

Don't enter a name enter account 31222646. You'll get now $9999.00! Also, try using the name GOO and entering account 11111111.

HINTS & TIPS continued

GUNFIGHTER

If you stay on the screen next to the jail, then all the bad guys will come to you.

HACKER

logon = AUSTRALIA

Security check 1: MAGMA LTD
" " 2: AX-0310479
" " 3: HYDRAULIC
" " 4: AUSTRALIA

HARD HAT MACK

Press 1,2, or 3 to start at those screens.

HENRY'S HOUSE

Type CPM at title screen for immortality.

INTERNATIONAL KARATE

If you turn quickly twice in a row, then you'll confuse your opponent.

Also, wait until the screen you want appears in the demo screen, then take the disk out, and press START or SELECT. Then, when you are about to go into the next level, put the disk back in to play the screen desired.

KICKSTART

When you hear the starting beep, pull the stick left to start at full speed.

LASER HAWK

Press B at the title screen for infinite lives during play.

LEADERBOARD

Press OPTION to leave the game and go on to the next course, carrying your old points score with you.

LOAD RUNNER

To use these features, hold down CONTROL while at the same time pressing the following keys:

F = increases lives
A = kill man (or whatever)
U = advance 1 level
R = end go
+ = slower
* = faster
D = change digging direction
K = Keyboard controls: I=up
M=down
J=left
K=right
J = Joystick mode

Hint: press CTRL-E while loading, for the editor command menu. From there type 1 character commands ('P' for play level, etc.).

A DISASSEMBLER

from Andy Thompson.

Hiya folks! How often have some of us always wanted to get hold of a program to disassemble the memory inside the Atari? Well, want no more coz here is the program which will allow you to do just that. You can disassemble the Operating System or the Basic language to see just how it works! Of course, if you are good enough then you can re-write some of the routines but you'll firstly need to turn your ROM Basic or OS into a RAM one. For this information you'll need to consult location 54017; $D301 of the 'Complete and Essential MAP' which should be on sale from TWAUG at this very moment. Just give them a bell to find out all the details.

Anyway, getting back to this program. It will run in normal Basic or Turbo Basic, but to properly run it in normal Basic you must replace all the lines with dashes in the REMarks. When you type the listing in be sure to save it to a DOS formatted disk so you don't lose it.

With this program you will also be able to disassemble any area of the Atari' memory to a printer, cassette or disk by making a simple change on line 154. The "S:" on this line simply means output is directed to the screen. "D:FILE" is for disk, "C:FILE" is cassette and "P:" is your connected printer. Anyway, besides disassembling the Basic or OS it is quite easy to do the same with any Machine-code program. Simply enter the DOS Utility Package by typing DOS in Basic. Load your chosen Machine-code file with option-L, but make sure you append "/N" to the filename, ie: "FILENAME.OBJ/N". Then, return to Basic, load this disassembler and run it. You'll have to know what address the Machine-code file occupies, you can find this out with this small Basic program:

```
10 OPEN #1,4,0,"D:MCFILE.OBJ"
12 DIM A$(6)
14 FOR I=1 TO 6
16 GET #1,B:A$(I,I)=CHR$(B)
18 NEXT I
20 S=ASC(A$(3,3)+256*ASC(A$(4,4))
30 E=ASC(A$(5,5)+256*ASC(A$(6,6))
40 ? "PROGRAM OCCUPIES MEMORY
";S;" - ";E
```

The main disassembler program is included on the issue 9 disks under the filename, DISASS.BAS.

MARK's GAMES COLUMN

by Mark Stinson

Regular readers will know that I have been promising a review of the public domain adventure "THE NEPHEW" for some time now. Well, I started to play this game some weeks ago, and unfortunately found that my copy was infested with bugs! The team at TWAUG are trying to locate a proper copy as I write. So, if a copy is found I will play it, and review it shortly!

In the meantime, I have a number of great hints, tips and solutions which will be appearing in the next few issues. So, lets kick off with some quick notes on that great aerial attack game, Blue Max 2001:

BLUE MAX 2001 tips brought to you by CAPTAIN HOOK.

Press SELECT to get to the options menu. From here, Press OPTION to change categories. The skill levels & gravity on/off are obvious. Pilot control and normal control determine the joystick control of your plane. If the control is on normal, then pushing the joystick up will climb in altitude and pulling it down will lower the altitude. In Pilot control, it is vice-versa. The bomb and touch sequencer will be discussed later. When you start the game, your saucer will be on a runway. (The following instructions will be described using the normal control mode). You then push up to take off. Make sure your plane is at a good altitude (20 or above) before you start moving. You push the joystick up to raise the altitude and down to lower the altitude. Right and Left move your plane right and left. Pushing to the upper left will cause the screen to start scrolling foward and the plane will move up on the screen. Pushing to the lower right will cause the plane to move down on the screen and to eventually stop the scrolling. The button shoots lasers and pushing down while pressing the button will drop bombs. HINT: climb a little before you drop a bomb as you lose altitude when you drop bombs. Watch carefully the colours on the bottom of the screen. If it is a flashing yellow, you are too low and will be damaged. If the colour is identical to the ground colour then you are at strafing level and can destroy smaller ground targets with your laser. If it is blue, then you are on the same level as the enemy planes are and you can shoot them. Pressing a direction on the joystick and pressing the button will shoot your lasers in that direction (You can't shoot down). Your saucer will also sustain damage from enemy flak and saucer crashes. Your plane will be destroyed when you crash or are hit a total of 5 times or are bombed during re-fueling and repairs. When you run into something or are hit by enemy flak, an operation on your ship will be damaged. It will be either your fuel tank, Laser(gun), Bomb releaser, or manoeuvrability. A letter will be displayed representing the part that was damaged. F for fuel leak G for laser gun B for bomb releaser M for manoeuvrability. After every sequence of enemy attacks, you will have the option to land on your runway for repairs, refueling, and more bombs. To do this simply bring your altitude to zero when you are above your landing pad. (A short pass with 3 grey buildings next to it). You may also activate your Shields which will sustain one hit before damaging any part of your ship. To do this, look for a blinking red small diamond shaped object. When you see it, land on it and your shields will be turned on. To move on to higher sequences, look for a small building that is round and appears to be hollow in the middle. It rests on the same size pad as the red diamond. If you are in the bomb sequencer mode, you must bomb it, if you are in the touch sequence mode you must land on it. However, the red diamond you must always land on for a shield.

Next we have the full solution to Enchanter, a great adventure from Infocom:

MARK's GAMES COLUMN continued

****
*
*
HOW TO SOLVE:
--- THE ENCHANTOR ---
*
*
****

This is the complete solution to the ENCHANTER adventure the text was ported and edited by DENON from ISRAEL.

NOTE:These are not hints! this is the complete answer to the whole adventure!

Type anything that is enclosed in quotes, nothing else!

(Separate commands are separated by a-)

THE ANSWERS:

"NE - N - OPEN OVEN - GET BREAD, JUG AND LANTERN - S - E - SE - NE - DRINK WATER - GET WATER - SW - SE - SW - SW - S - READ SCROLL - NE - NE - E - E - GNUSTO REZROV - MEMORIZE REZROV - REZROV GATE - E"

You are now in the castle. When the program says that your throat is dry, then drink water. When it says that your stomach is grumbling, eat bread.

"READ BOOK - MEMORIZE FROTZ - FROTZ LANTERN - S - S - E - S - OPEN DOOR - N - READ WRITING - REMOVE BLOCK - E - GET SCROLL - READ SCROLL - GNUSTO EXEX - W - S - U - DROP ALL - E - GET LIGHTED PORTRAIT - GET SCROLL - W - GET ALL - READ SCROLL - GNUSTO OZMOO - N - N - E - MEMORIZE OZMOO - E - OZMOO ME -" (WAIT TWO TURNS..IE. TAKE INVENTORY TWICE)" - D - OPEN SOUTH DOOR - S - GET ALL - N - W - W - S - CUT ROPE WITH DAGGER - OPEN BOX - GET SCROLL - READ SCROLL - MELBOR ME - S - W - U - SIT ON BED - SLEEP"

When you sleep, you will have a dream about the bed you are sleeping on. All dreams are hints! Also, from now on, anytime the program tells you that you are tired, then sleep. (Yes, right on the floor!) The reason you have to sleep on the bed is so you can have this certain dream. Now, on with the adventure.

"STAND UP-EXAMINE BEDPOST - PUSH BUTTON - GET SCROLL - READ SCROLL - GNUSTO VAXUM - D - E - E - E - S - SE - MEMORIZE NITFOL - NITFOL TURTLE - MEMORIZE EXEX - EXEX TURTLE - TURTLE, FOLLOW ME - NW - N - E - U - TURTLE, SE, GET SCROLL, NW - GET SCROLL - TURTLE, STAY - D - W - N - N - N - N - EXAMINE ASHES - FOLLOW TRACK - REACH IN HOLE - READ SCROLL - N - MEMORIZE REZROV - REZROV GATE - N - GET SCROLL - READ CRUMPLED SCROLL - S - W - W - W - W - W - U - GET EGG - MEMORIZE REZROV - REZROV EGG - DROP EGG - GET SCROLL -READ SHREDDED SCROLL -KREBF SHREDDED SCROLL - D - MEMORIZE VAXUM - E"

You will now be in one of four mirror rooms. Wait in any one until you see an adventurer from ZORK I on the other side of the mirror. When you see him:

"ZIFMIA ADVENTURER - VAXUM ADVENTURER - SHOW DAGGER TO ADVENTURER -" (GO EAST UNTIL YOU GET TO A ROOM WITH MONSTERS GUARDING A DOOR) "- POINT AT DOOR - N - DROP ALL BUT BREAD, JUG AND LANTERN - GET MAP AND PENCIL - S - CLOSE DOOR - W - W - W - W - W - W - S - S - S - W - W - W - NW - NE - FILL JUG - SW - SE - E - E - E - S - S - E - S - D"

This is the second to last part of the adventure. At this point you are in a very weird kind of room! Remember the map you picked up? Read it now. The map is the map to the translucent corridors.
If you connect two of the letters (ie.'Connect B and J") then you will actually make a corridor! Now, what you are going to do is release ultimate evil from its lair and erase certain so you trap him in another part of the translucent corridors. You want to do this because the scroll that you need to kill krill with is in his lair!

OK this is how you do it:

"S - E - NE - SE - CONNECT F AND P - SW - SW - GET SCROLL - ERASE B AND R -

MARK's GAMES COLUMN
continued

ERASE V AND M - NE - NW - NW - CONNECT B AND J - W - READ POWERFUL SCROLL - U - U - E - E - N - N - N - N - N - E - OPEN DOOR - N - DROP MAP AND PENCIL - GET ALL BUT MAP AND PENCIL - S - W - S - S - E - E"

Now try going up the stairs. You can climb them but you can't reach the top! This stairway is the last puzzle you need to solve before you kill krill.

"MEMORIZE VAXUM - KULCAD STAIR - READ ORNATE SCROLL - IZYUK ME - E - GONDAR DRAGON - VAXUM BEING - GUNCHO KRILL"

THAT'S IT!!!

GAMES REVIEWS

by Mark Fenwick

MIECZE VALDGIRA

Tiger Developments, renowned for their quality software, Lizard and Mission Zircon to name a couple, have recently aquired the rights to supply you lucky 8-bitters with two recent Polish games. These games being Miecze Valdgira (nice name!) and Kult, both are of a high quality in graphics, sound and, of course, gameplay, the latter being the most important.

The story behind Miecze Valdgira revolves around a search for the sword of Valdgira. Apparantly the Emperor of Lizdrane has been rightly or wrongly informed by a prophet that a Prince will arrive with the sword and behead the Emperor. This is where you come in, the Emperor has placed his life in your hands as you are given the task of finding the sword before the Prince!

The screen is split in to two thirds playing area while the lower third shows health and inventory. The scene is a castle taken from a side view perspective. Our character stands well defined, the graphics of the walls and objects in each room are well detailed. Each room is full of mysterious flying objects, which move so smoothly in an oval fashion, appearing to float.

GAMES REVIEW
continued

These must be destoyed by shooting at them as contact with them results in a sudden drop in health. Each room holds floating nasties, differing greatly in shape, colour, size and speed.

As with all graphic adventures of this type, objects must be picked up in order to be used at a later stage. Various objects lay around awaiting retreival, the obvious being keys to enable your chap to get through locked doors around the castle. Up to seven items can be carried at once, picking up an item is achieved by pulling back on the joystick, the object will then be displayed in one of the seven boxes in your inventory in the lower part of the screen. To use an object simply pull back on the joystick, move left or right to select an item and press fire to use it. A screen prompt will scroll in the lower part of the screen informing you on both occasions what the object is. Unfortunately, unless you're Polish this may prove to be of little help at all!

As you prgress through the screens bumping off the nasties and picking up objects, you'll realise the vastness of the game. Stairs will lead you up or down to more rooms in your search for the Valdgira sword.

The graphics and music are really stunning as is the smooth gameplay. The added bonus of the flying matter, different scenery for each room and the collection of items makes this game a real winner! My only critism is the Polish text prompts, given the number of users it would not be feasable to do an English conversion, though if enough sales were made this could warrant some kind of a translation card to use with the game. However, saying this reflects no real problem when playing the game, so go get a copy and show your support for this small English team!

Miecze Valdgira is currently available from Tiger Developments, 159 Warley Road, Halifax, West Yorkshire, HX1 3TW. At a more than decent price of £4.99, and worth every penny!

GAMES REVIEW continued

KULT

Also from Tiger Developments another top notch Polish import comes Kult.

Kult is a shoot 'em up which will appeal to both young and old. With a feel of Zybex this game is sure to prove to have lasting appeal in the gameplay department.

You have been chosen to fly your high powered helicopter over the Earth's surface blasting every possible nasty in sight. After all this is a shoot 'em up!

The screen is split into a small bar at the top showing score, number of craft to date, your position in the level and ETAP ? hmmm, level. The bottom of the screen shows your status, weapon in play, tokens collected (bonus points at level end) and a nifty little fuel can representing, yep, fuel. Both bars take little room leaving the rest of the screen the playing area.

Kult is similar in many ways to Zybex, continuous fire, the button only being used to change weapon and the special icons which appear when a nasty is killed. These range from fuel and tokens to an assortment of weapons. Though similar in these ways to Zybex, it is not a carbon copy, just as good though, but lacking only in colour. The whole game is set in mono, don't let this put you off though as the graphics are very well defined and the lack of colour doesn't hinder the game in any way.

You start off with a single firing weapon, not much cop at all! As the screen scrolls horizontally to the left, trees, building etc scroll beneath you, as do the menacing nasties for you to bump off. These vary a lot in both shape and size and differ in intelligence. Once you begin to bump these off you'll see special icons for power ups left behind where the nasties were. Like in Zybex simply move your craft over these to collect them. Under your first weapon on the lower part of the screen when starting off you will have noticed a small dash, this represnts the power of that weapon.

As you collect more special weapon icons you'll notice another dash appear depending which weapon icon you collected. One dash represents slow fire while three dashes is maximum rapid fire for each weapon. Once you have at least one power dash to a weapon you can select another fire power by simply pressing fire to hi-light your desired weapon. There's quite a variety to choose from and as long as you get the desired icons you can spread your fire power ie. fire forward up and down at the same time, forward and behind you. Selection is quick and simple just press fire to select, you'll be swapping many times as some nasties take a little bit more hammer before becoming part of the landscape!

At theend of each level there's a level boss which are quite large in size, beware as these fellows take quite a lot of hammer before being blown away. Once you've wiped out this boss you then progress to the next level, where you fly over a different landscape as well as tougher nasties to contend with. With a little practice you'll soon have a score high enough to get you on the leaderboard! The high score table holds up to ten names, which bounce (similar to the score on Cavernia) accompanied with a lively piece of music and graphically, it's well done.

Kult certainly is the best shoot 'em up to appear for a long while, with choice of weapons and pure addiction it'll have you coming back again and again. An excellent game, with many levels and nasties plentyful, where there's no need for an English translation, just shoot everything in sight! Both Miecze Valdgira and Kult come with what can be seen as a tedious protection process, cosisting of an A4 grid needed to line up for loading passwords. Tedious it may be but it would appear necessary, so don't let this put you off. Kult is available from Tiger Developments for £4.99 and damn good value at that!

CRACKING THE CODE

by Keith Mayhew

Re-printed by M. Gerum

This article first appeared in "The UK ATARI Computer Owners Club" later renamed "MONITOR"

Part 9

In the previous issue we looked at the way in which the memory map is organised. As far as the hardware is concerned, almost every action of the ATARI is controlled by one of the four main chips of the machine. We start this time with a description of the tasks they perform and the facilities available.

Names were put to the four chips last time: GITA, ANTIC, POKEY and PIA. The first three are totally custom, that is they were designed specifically for the ATARI machines. The PIA chip, however is a standard chip found in many other computers.

THE CHIPS

The addresses of the registers of these four chips are listed in Table 1 together with the names by which they are normally referred. Hyphenated names represent a series of names all differing by a single digit e.g.TRIGO-3 represents TRIGO, TRIG1, etc. and correspond to the range of addresses shown. Do not forget that if a register is write-only then you will not be able to read the same data back again, similary, any data written to a read-only register will not affect its contents. For instance, it is easy to fall into the trap of using an INC instruction to try and add one to the contents of a write-only register! "Shadow" registers are maintained by the operating system of some of the registers; these are shown in the table to the right of a register, if applicable. Most of these are used to hold the data to be written to a write-only register; this update occurs 50 times every second. Thus by using these shadows it is possible to read back the data currently used without having to keep your own private copy.

We will start with GTIA and ANTIC which are primarily concerned with producing the display image. These two chips are functionally independent of each other but neither are of any practical use without the others help. It is therefore best if you consider these two chips as one large chip which controls the display. ANTIC is said to have derived its name from "Alpha Numeric Television Interface Controller". This is rather an understatement of its capabilities as it is in fact a second processor to the 6502 which executes its own special, limited, instruction set dedicated to producing the main display information. GTIA, said to stand for "George's Television Interface Adaptor", takes the bare output of ANTIC and brings it to life by adding colour information and player/missile data.

Listing 1 shows a program to display a single player on the screen in the form of a large cursor and allows it to be moved around the screen within the confines of standard screen area. Listing 2 shows a BASIC program which loads the code in. To run it type:

```
X=USR(1536)
```

Then it will return after displaying the player at the top of the screen. The graphics mode is irrelevant as players can be displayed on any type of screen. Once the program returns BASIC can continue processing because the player is moved under joystick control by a routine which executes 50 times a second during each vertical blank. This is the period of time when the electron beam stops "drawing" and returns to the top of the screen after each frame has been displayed.

CRACKING THE CODE continued

Before we study how the program works we will look at the facilities offered to control the display of players and missiles.

SPRITES

Player/missiles or sprites as they are commonly known, are objects which can be displayed and moved independently of the main image with great ease and speed. The player/missile data displayed at any time is dependent on the contents of the player/missile graphics registers. The registers are GRAFP0 to GRAFP3 for each of the four players and GRAFM to control the four missiles. On every scan line of the screen these graphics registers are read and there data is displayed at the current horizontal positions for each as determined by the eight registers HPOSP0 to HPOSP3 and HPOSM0 to HPOSM3. For the four players, all eight bits in the appropriate graphics register are displayed; a bit set to zero will cause no change to the display i.e. they are transparent. The missile graphics register controls the display for each of the four missiles. Bits 0 and 1 correspond to missile 0 and are positioned according to HPOSM0, the rest of the bits are assigned to the other three missiles in sequence such that bits 6 and 7 control missile 3.

If you position a player or missile on the screen by writing to its horizontal position register and then write some data to its graphics register then the pattern will be displayed down the screen as a vertical bar. For instance try the following from BASIC:

```
POKE 53261,255
POKE 53248,128
```

This sets the data for player 0 to 255 i.e. all ones, and positions it roughly in the middle of the screen. to display a proper image on the screen requires changing the data in the graphics register in real time i.e. on every scan line.

Although this can be achieved by machine code, with appropriate timing, this process can be automated by the ANTIC chip by a function known as Direct Memory Access or DMA. This allows data to be fetched from memory independently of the 6502 and at a faster rate. If this method is used then the data for players and missiles is stored in a table and ANTIC is informed where to find it by a register called PMBASE. If player/missile DMA is enabled then ANTIC will fetch the data for the players and missiles and store it in GTIA's graphics registers on each scan line, thus building up the images in the table onto the screen in real time.

We will now look at the program in Listing 1 to see how a player can be moved around the screen using ANTIC's DMA to transfer the data from a table. The first equates define the locations used in the hardware for player/missile generation. The next two equates are vectors within the operating system to gain access to the vertical blank processor. The O.S.Shadows are then defined followed by the program's equates. PLRTAB is the address where the player/missile table will be stored and POSTRT is the address in that table of where the data for player 0 is stored. XMIN and XMAX define the confines of the horizontal position of player 0 to keep it on the screen. YMIN and YMAX are the indexes into the player's data area to keep the image on the screen. Lastly, COLOUR is the value which will be stored in the player's colour register to set it to white.

CURSX and CURSY in page zero are used to keep track of the player's current position. The program starts off by initialising some registers ready for the display of players. The routine INITPM first sets the position of each of the players to zero (off screen) and then sets the colour and size of player 0. PMBASE is then loaded with the high byte of the address of our player table (PLRTAB). To enable ANTIC to perform DMA we alter some bits in the shadow DMA control register (SDMCTL). Clearing bit 4 and setting bit 3 gives 2-line resolution and enables DMA respectively. Note that we could have simply stored an actual number in SDMCTL but instead we are not altering the effect of any of the other bits currently used by using AND and OR operations to set and clear the appropriate bits we are interested in.

CRACKING THE CODE continued

Lastly storing 2 in the graphics control register allows the DMA data to be transferred into GTIA's graphics registers.

The routine CLEAR is then executed to zero any data stored in player 0's 128 byte data area in the table. The value in CURSX is set to its miminium value and the horizontal position register (HPOSP0) is updated with the same value. CURSY is then initialised to its minimum value and the image is drawn at the position in the player table by the routine DRAW. This copies the data at the end of the program, referred to as CURSOR, into the player table at the index specified by CURSY. The number of bytes to be copied is eight, but this has been left to the assembler to calculate by the expression: CRSLEN = * - CURSOR. This subtracts the address of the first byte of the byte of the image away from the address of the last plus one, thus giving the number of bytes defined. The advantage of this is that more, BYTE's could be added and the program would deal with the extra data without any other changes. The last thing the program does before returning is to tell the operating system where to find our vertical blank routine called VBI. This is done by a call to SETVBV in the operating system with X and Y pointing to the routine and A holding the number 7.

The VBI routine tests the joystick for any movement. If the joystick is not moved then the program returns to the operating system by a jump to XITVBV. Otherwise the joystick has been moved and the image is erased from the player table in anticipation of a vertical movement up or down the data table. The variables CURSX and CURSY are then updated depending on the joystick state. The horizontal position of the player is then updated and the image is redrawn at the current CURSY value.

Note that the vertical repositoning of the player requires moving its data up or down in the player//missile table. This has been achieved by erasing and re-drawing the image at a new position. Alternatively, two routines could have been written to move the data in the table up or down as required by an arbitrary number of bytes. The best movement routine will depend on the program using it. For instance in this case the cursor is only ever moved by one byte at a time so a simple ,dedicated, pair of routines could have been written to move the shape by only one byte up or down which would have been faster but more limited.

Next time we will continue or look at the graphics facilities in more detail and start looking at display lists.

Table 1

NOTE: (R)=Read only (W)= Write only (R/W)= Read & Write

NAME		ADDRESS (HEX)	NAME	ADDRESS (HEX)
GTIA REGISTERS			O.S.SHADOW	
PAL	(R)	D014		
CONSOL	(R/W)	D01F		
GRACTL	(W)	D01D		
TRIG0-3	(R)	D010-D013	STRIG0-3	0284-0287
VDELAY	(W)	D01C		
PRIOR	(W)	D01B	GRPRIOR	026F
HITCLR	(W)	D01E		
GRAFP0-3	(W)	D00D-D010		
GRAFM	(W)	D011		
SIZEP0-3	(W)	D008-D00B		
SIZEM	(W)	D00C		

CRACKING THE CODE continued

HPOSP0-3	(W)	D000-D003		
HPOSM0-3	(W)	D004-D007		
M0-3PF	(R)	D000-D003		
P0-3PF	(R)	D004-D007		
M0-3PL	(R)	D008-D00B		
P0-3PL	(R)	D00C-D00F		
COLPF0-3	(W)	D016-D019	COLOR0-3	02C2-02C7
COLBK	(W)	D01A	COLOR4	02C8
COLPM0-3	(W)	D012-D015	PCOLR0-3	02C0-02C3

ANTIC REGISTERS			O.S.SHADOW	
NMIEN	(W)	D40E		
NMIST	(R)	D40F		
NMIRES	(W)	D40F		
WSYNC	(W)	D40A		
VCOUNT	(R)	D40B		
PENV	(R)	D40D	LPENV	0235
PENH	(R)	D40C	LPENH	0234
CHBASE	(W)	D409	CHBASE	02F4
PMBASE	(W)	D407		
CHACTL	(W)	D401	CHART	02F3
DMACTL	(W)	D400	SDMCTL	022F
DLISTL	(W)	D402	SDLSTL	0230
DLISTH	(W)	D403	SDLSTH	0231
VSCROL	(W)	D405		
HSCROL	(W)	D404		

POKEY REGISTERS			O.S.SHADOW	
SKCTL	(W)	D20F	SSKCTL	0232
SKSTAT	(R)	D20F		
SKRES	(W)	D20A		
SERIN	(R)	D20D		
SEROUT	(W)	D20D		
IRQEN	(W)	D20E	POKMSK	0010
IRQST	(R)	D20E		
KBCODE	(R)	D209	CH	02FC
ALLPOT	(R)	D208		
POT0-7	(R)	D200-D207	PADDL0-7	0270-0277
POTGO	(W)	D20B		
AUDCTL	(W)	D208		
AUDC1	(W)	D201		
AUDC2	(W)	D203		
AUDC3	(W)	D205		
AUDC4	(W)	D207		
AUDF1	(W)	D200		
AUDF2	(W)	D202		
AUDF3	(W)	D204		
AUDF4	(W)	D206		
STIMER	(W)	D209		
RANDOM	(R)	D20A		

PIA REGISTERS			O.S.SHADOW	
PORTA	(R/W)	D300	STICK0-1	0278-0279
PORTB	(R/W)	D301	STICK2-3	027A-027B
PACTL	(R/W)	D302		
PBCTL	(R/W)	D303		

CRACKING THE CODE continued

```
0100 ;Hardware register equates...
0110 PMBASE  =      $D407   ;Player/missile base.
0120 GRACTL  =      $D01D   ;Graphics control.
0130 HPOSP0  =      $D000   ;Horizontal pos. of player 0.
0140 SIZEP0  =      $D008   ;Size of player 0.
0150 ;Operating system vectors...
0160 SETVBV  =      $E45C   ;Set vertical blank vector.
0170 XITVBV  =      $E462   ;Exit vertical blank vector.
0180 ;Operating system shadows...
0190 STICK0  =      $0278   ;Joystick 0 value.
0200 SDMCTL  =      $022F   ;DMA control.
0210 PCOLR0  =      $02C0   ;Colour of player 0.
0220 ;Program equates...
0230 PLRTAB  =      $4000   ;Start of player/missile table.
0240 P0STRT  =      PLRTAB+$200 ;Start of player 0 data.
0250 XMIN    =      $30     ;Minimum X position.
0260 YMIN    =      $0F     ;Minimum Y position.
0270 XMAX    =      $C8     ;Maximum X position.
0280 YMAX    =      $67     ;Maximum Y position.
0290 COLOUR  =      $0F     ;Colour of player.
0300 ;Page zero variables...
0310         *=     $CB     ;Set to page zero area.
0320 CURSX   *=     *+1     ;Cursor X position.
0330 CURSY   *=     *+1     ;Cursor Y position.
0340         *=     $0600   ;Start program at page 6.
0350         PLA            ;Clean stack.
0360         JSR    INITPM  ;Initialise player/missiles.
0370         JSR    CLEAR   ;Clear player 0 data area.
0380         LDA    #XMIN   ;Set X position
0390         STA    CURSX   ; to minimum.
0400         STA    HPOSP0  ;Save in register too.
0410         LDA    #YMIN   ;Set Y position
0420         STA    CURSY   ; to minimum.
0430         JSR    DRAW    ;Draw cursor there.
0440         LDY    #VBI&$FF ;Get address of VBI routine
0450         LDX    #VBI/256 ; in X & Y registers.
0460         LDA    #7      ;Deferred VBI.
0470         JSR    SETVBV  ;Change vector.
0480         RTS            ;All done - back to BASIC.
0490 ;
0500 ; Vertical blank interrupt.
0510 VBI     LDA    STICK0  ;Get stick value.
0520         CMP    #$0F
0530         BEQ    VBEXIT  ;Exit if no movement.
0540         JSR    ERASE   ;Erase current cursor image.
0550         LDA    STICK0  ;Get stick value.
0560         AND    #1      ;Test 'up' bit.
0570         BNE    DOWN    ;Skip if not down.
0580         LDA    CURSY   ;Test Y value
0590         CMP    #YMIN   ; against minimum.
0600         BEQ    LEFT    ;Skip if there.
0610         DEC    CURSY   ;Decrement Y value.
0620         JMP    LEFT    ;Try left direction.
0630 DOWN    LDA    STICK0  ;Get stick value.
0640         AND    #2      ;Test 'down' bit.
0650         BNE    LEFT    ;Skip if not down.
0660         LDA    CURSY   ;Test Y value
0670         CMP    #YMAX   ; against maximum.
0680         BEQ    LEFT    ;Skip if there.
0690         INC    CURSY   ;Increment Y value.
0700 LEFT    LDA    STICK0  ;Get stick value.
0710         AND    #4      ;Test 'left' bit.
0720         BNE    RIGHT   ;Skip if not down.
0730         LDA    CURSX   ;Test X value
0740         CMP    #XMIN   ; against minimum.
0750         BEQ    MOVE    ;Skip if there.
0760         DEC    CURSX   ;Decrement X value.
0770         JMP    MOVE    ;Skip to move.
0780 RIGHT   LDA    STICK0  ;Get stick value.
0790         AND    #8      ;Test 'right' bit.
0800         BNE    MOVE    ;Skip if not down.
0810         LDA    CURSX   ;Test X value
0820         CMP    #XMAX   ; against maximum.
0830         BEQ    MOVE    ;Skip if there.
0840         INC    CURSX   ;Increment X value.
0850 MOVE    LDA    CURSX   ;Update player position.
0860         STA    HPOSP0
0870         JSR    DRAW    ;Re-draw player shape.
0880 VBEXIT  JMP    XITVBV  ;Exit to operating system.
0890 ;
0900 ;Initialise player/missiles.
0910 INITPM  LDA    #0      ;Get zero.
0920         LDX    #3      ;Set index.
0930 POSLP   STA    HPOSP0,X ;Zero position of player.
0940         DEX            ;Next player.
0950         BPL    POSLP   ;All done?
0960         LDA    #COLOUR ;Get colour value.
0970         STA    PCOLR0  ;Set player's colour.
0980         LDA    #0      ;Set size to normal.
0990         STA    SIZEP0
1000         LDA    #PLRTAB/256 ;High byte of table address.
1010         STA    PMBASE  ;Save in hardware register.
1020         LDA    SDMCTL  ;Get DMA control value.
1030         AND    #$EF    ;Set 2-line resolution.
1040         ORA    #$08    ;Enable player DMA.
1050         STA    SDMCTL  ;Save back.
1060         LDA    #$02    ;Allow player image
1070         STA    GRACTL  ; to be displayed.
1080         RTS            ;Return.
1090 ;
1100 ;Erase all data for player 0.
1110 CLEAR   LDY    #$7F    ;Index to end of area.
1120         LDA    #0      ;Data is zero.
1130 CLRLP   STA    P0STRT,Y ;Zero a byte.
1140         DEY            ;Next one.
1150         BNE    CLRLP   ;All done?
1160         RTS            ;Return.
1170 ;
1180 ;Erase cursor at current Y position.
1190 ERASE   LDA    CURSY   ;Get cursor Y vaue.
1200         CLC            ;Add on number of bytes
1210         ADC    #CRSLEN ; of cursor data.
1220         TAY            ;Save as index.
1230         LDA    #0
1240 ERASLP  STA    P0STRT,Y ;Zero a byte.
1250         DEY            ;Next one.
1260         CPY    CURSY   ;Test against limit.
1270         BPL    ERASLP  ;All done?
```

CRACKING THE CODE continued

```
1280          RTS             ;Return.
1290 ;
1300 ;Draw cursor at current Y position.
1310 DRAW     LDA     CURSY   ;Get cursor Y position.
1320          CLC             ;Add on number of bytes
1330          ADC     #CRSLEN ; of cursor data.
1340          TAY             ;Save as index.
1350          LDX     #CRSLEN-1 ;Index to end of cursor data.
1360 DRAWLP   LDA     CURSOR,X ;Get data byte.
1370          STA     P0STRT,Y ;Save it in player area.
1380          DEY             ;Next byte in player area.
1390          DEX             ;Next byte in table.
1400          BPL     DRAWLP  ;All done?
1410          RTS             ;Return.
1420 ;
1430 ;Data for cursor.
1440 CURSOR   .BYTE   $18     ;Image data.
1450          .BYTE   $18
1460          .BYTE   $18
1470          .BYTE   $E7
1480          .BYTE   $E7
1490          .BYTE   $18
1500          .BYTE   $18
1510          .BYTE   $18
1520 CRSLEN   =       *-CURSOR ;Number of bytes defined.
```

Listing 2.

```
QZ 10 DIM HEX$(16)
CV 20 LINE=10000:TRAP 100:J=0:START=1536
VA 30 READ HEX$,CHKSUM:SUM=0
AA 40 FOR I=1 TO 15 STEP 2
ZG 50 D1=ASC(HEX$(I,I))-48:D2=ASC(HEX$(I+
   1,I+1))-48
KT 60 NUM=((D1-7*(D1>16))*16+(D2-7*(D2>16
   )))
LW 70 SUM=SUM+NUM:POKE START+J,NUM:J=J+1:
   NEXT I
LY 80 IF SUM=CHKSUM THEN LINE=LINE+10:GOT
   O 30
IN 90 ? "Checksum error on this line:"
VO 95 LIST LINE:END
YS 100 PRINT "Data in memory."
NY 10000 DATA 68207606209F86A9,626
AP 10010 DATA 3085CB8D00D0A90F,917
HR 10020 DATA 85CC20BB06A01FA2,915
KR 10030 DATA 06A90720SCE460AD,803
EU 10040 DATA 7802C90FF04D20AA,857
NU 10050 DATA 06AD7802290ID00B,562
LY 10060 DATA A5CCC90FF014C6CC,1247
RC 10070 DATA 4C4A06AD7802290Z,494
QD 10080 DATA D008A5CCC967F002,1131
QW 10090 DATA E6CCAD7802290ID0,982
EZ 10100 DATA BBA5CBC930F014C6,1086
QT 10110 DATA CB4C6B06AD780229,728
SQ 10120 DATA 08D008A5CBC9C3F0,1233
LF 10130 DATA 02E6CBA5CBBD00D0,1152
KD 10140 DATA 20BB064C62E4A900,796
LS 10150 DATA A2B39D00D0CA10FA,998
WN 10160 DATA A90F8DDC002A9008D,829
JX 10170 DATA 08D0A9408DB7D4AD,982
WJ 10180 DATA 2F8229EF89088D2F,534
CO 10190 DATA 02A9028D1DD060A0,307
XW 10200 DATA 7FA9009908428800,859
RM 10210 DATA FA60A5CC186900A8,1020
KR 10220 DATA A900990042880C4CC,924
KS 10230 DATA 10FB60A5CC186900,866
TP 10240 DATA A8A207BDCEB69900,891
HS 10250 DATA 42880CA10F6601818,818
LQ 10260 DATA 18E7E7181818,558
```

FIVE LINERS

BIG TEXT by Mark Godfry

Displaying large characters on a graphics 8 screen is normally impossible, but this routine shows you how to do it. The program reads the characters definition from the character table and then POKES this directly to the screen, blowing it up as necessary.

LINE BREAKDOWN

10 Gets the desired string from the user.
20 Gets the desired size and begins to read the character from the table.
30 Checks to see if the right hand side of the screen has been reached.
40 Finds the location of the screen.
50 Puts the characters onto the screen one line at a time.

```
10 DIM B$(100):GRAPHICS 0:POSITION 15,0
:? "TYPE TEXT":POSITION 1,3:POKE 710,0:
INPUT B$:? :? "SIZE(1/10)"
20 INPUT SIZE:GRAPHICS 8:POKE 710,0:FOR
I=1 TO LEN(B$):LOOK=57344+(ASC(B$(I,I))
-65)*8+33*8
30 IF I<39 THEN H=(8*40*SIZE)
40 SCRN=PEEK(88)+PEEK(89)*256+I+H:FOR
J=0 TO 7 STEP (1/SIZE)
50 POKE SCRN+J*(40*SIZE),PEEK(LOOK+J)
:NEXT J:NEXT I
```

MULTICOLOURED BACKGROUND BY Steven Crowe

We all know that the ATARI has some amazing graphics facilities, but how about a multicoloured background on a Graphics 0 text screen?

FIVE LINERS continued

The effect can easily be achieved with DLI's and a touch of machine code. In fact it's really a four liner !

Line 10 modifies the Display List to cause a jump to our machine code after each line of text has been displayed.

Line 20 Loads the machine code into Page 6. The address is given tio ANTIC by setting locations 511 & 512, and the interupt is enabled with POKE 54286,192.

Line 30 Contains the Data for the machine code routine.

Line 40 Contains the data for the colours of each of the 24 lines. Each number is given by (COLOR Number *16)+ brightness. If you use numbers lower than 6, then try POKE 709,14 in Line 10, or you might not be able to read the text.
To remove the display, either press the RESET button or enter a new Graphics command.

```
10 GRAPHICS 0:POKE 709,0:DL=PEEK(560)
+256*PEEK(561)+6:POKE DL-3,194:FOR X=DL
TO DL+22:POKE X,130:NEXT X
20 FOR X=0 TO 58:READ D:POKE 1536+X,D:
NEXT X:POKE 512,0:POKE 513,6:POKE 54286
,192:POKE 710,10
30 DATA 72,138,72,175,34,6,189,35,6,141
,8,212,141,24,208,232,142,34,6,138,24,2
33,23,208,5,169,0,141,34,6,104
31 DATA 170,104,64,0
40 DATA 26,42,58,74,90,106,122,138,154,
170,186,202,218,234,250,10,26,42,58,74,
90,106,122,138
```

LETTER SECTION

A letter from the OL'HACKERS President to TWAUG.

As usual your newsletter efforts surpass your prior issues. The tutorials are very well done and extremely instructive. The result is, that you fill a large hole that was created by the loss of commercial 8 Bit magazines. Please keep doing what you are doing so well! The 8 Bit world is indebted to you for your fine work.

ALEX PIGNATO

A letter from the Editor to our readers.

Hi there! I wonder why we are not getting any feed back on any subject we are writing in the issues. Is it that we are doing a good job or are we writing about the subjects you want to read.

I am sure there are readers out there who would like to see articles on other subjects of their choice. Maybe someone would like to tell us what they think of our newsletter, either something nice or maybe a criticism about the mistakes we are making.

If you are afraid of writing because you think your spelling is not up to much or you cannot express yourself properly, don't worry, any articles or letters published are all proof read and corrected.

I'll tell you a little story shall I? Before I got volunteered into this editor business I use to think that my english was appalling, well it still is, and that my spelling was very bad as well. I still make spelling mistakes even the newspapers have mistakes in them so I don't worry any more. I can remember writing one article to a newsletter before TWAUG actually started and I was told by the editor of that missive that is was well written, I was over the moon, I didn't think I had it in me. You see it only needs a little push and effort and I am sure you'll be able to do what I did.

So please let us know what you think about TWAUG or whatever. Write to:

T.W.A.U.G.
P.O.BOX No.8
WALLSEND
TYNE & WEAR
NE28 6DQ

S.A.M.S.

The first Spring All Formats Show.

Due to the success of the AMS shows held in Stafford over the past few years, the organisers decided to try a spring show and see what response they would get. I believe that they are very pleased with the first SAMS show as there were over 90 stands.

As with the AMS shows, the Atari 8-bit was very well supported, Page 6, Gralin, L.A.C.E, Micro Discount DGS and of course TWAUG all attended and we were pleased that Ke-Soft and ANG both decided to attend bringing many new titles for the 8-bit including the Brundle's editor program. Unfortunately, due to unforeseen last minute problems, NOSAUG were unable to attend.

It was another successful day for TWAUG, as well as meeting many old friends, we made many more new friends. We would like to thank all those who came and supported us at our stand, without their help, we wouldn't be able to attend. We are already looking forward to the next AMS show in November.

As most of you will know, Max was unable to be with us at the last AMS show due to the fact that he had just come out of hospital after a big operation. I'm glad to say that he was able to be with us this time and was a great support behind the stand. I know that Max would like to add a little to this article himself, so I'll hand over to him to finish it off.

Thank youuuuu very much I expected that, but never mind here we go.

I would also like to add my thank you to everyone who enquired about my health, yes I am much better now than I was before the operation.

As David said the show had been well attended, people from Germany, Holland and from France were there. A TWAUG supporter from France bought all the back issues and made sure that he receives the next issues as well and to top it all he even ordered the new book "The Complete and Essential Map" for the XL/XE and paid for it in advance. If he isn't a keen supporter of TWAUG and of course of the Atari Classic, I don't know who is, for that I would like to thank him again.

I had a walk around the hall to have a look at all the other stands and I thought that this time many more exhibitors attended this show then the previous November shows. I also believe that a number of new exhibitors were in attendance this time, of course I cannot comment on the November 93 show because I took a rest from attending. If the next show is as well supported, by exhibitors and Atari Classic supporters, I am sure our little 8-bit will live for a long time to come.

David and Max

DISK CONTENT

Side one of this issue disk again is full of games and utils for your enjoyment.

ASYLUM.BAS: This Basic game is something like FROGGY from the Old Atari User magazine, where you had to get across the road and avoid the cars! In Asylum you have to grab the keys, you use the joystick to control a star that has its own mind where it wants to go. You have only three lives which are very easily lost.

BATCAVES.BAS: Also a Basic game, when loaded the instructions are displayed on the screen. After you've read the instructions you are then asked for the number of players taking part. You can press Return or the fire button to begin and just follow the prompts on the screen.

INVERTER.BAS and RAINBOW1.BAS are two demo programs, both will run from the issue disk, when one finishes the second one will start.

MMT160.BAS: This little Basic program is a printer driver for a Mannesmann-Tally-160 written by RALPH BRADLEY.

PBI.M65: You need the MAC-65 assembler for this program and it is to go with the Parallel Bus article in this issue.

FLOYD.OBJ: Floyd the Droid goes blasting. This is a game written by Paul Lay it is fast and furious, it gives the joystick a hammering.

VISIPLOT.BAS: I haven't had the time to run this program. The documentation of this program is on the disk load it with the "C" option from DOS to read it or use a word processor.

DASM6502.OBJ: Load this program using the "L" option from DOS and make sure Basic is disabled. It is a nice little program for the assembly language, doc file is on the disk.

MEGABUG.OBJ: This is a debugging program for MAC-65. Doc file is on the disk.

On Side 2 of our disk you'll find two OBJ files both must be loaded with the "L" option from DOS and Basic disable.

THINK.OBJ: This is Tetris type of game with a doc file on Side two.

SUPERHOP.OBJ: This is a Fractal picture viewer. Use the "L" option to run it, when loaded a menu is displayed on the screen and by pressing the first character on the menu will activate that function.

COPYRIGHT LAW

COPYRIGHT MADE EASIER

A quick guide to the intricacies of copyright laws.

By David Wyn Davies.

During the past few months, I've had cause to find out more about the UK copyright laws and a letter published in issue 66 of New Atari User has given me the opportunity to write an article about the subject... So here goes.

DEALING WITH COMPANIES

Dealing with companies that are still operating is one of the easiest thing to do where copyrights are concerned. Most companies hold full copyrights to their past products, even if some of those products were written by outside developers. This is because Most of the Atari 8-bit titles were written at a time when software publishers tended to take advantage of programmers.

If you find a company willing to pass on copyrights of a game, you had better make sure that you have a healthy bank balance. A figure of about £100 per title is often quoted, even if the titles on offer are not of high quality.

One company I've written to has released several games for the Atari in the past, but only one is even remotely worthy of investing that much cash. So, if a company does quote a figure, it usualy means that they are willing to offer you full transfer of copyright... However, Don't be daft and pay, say, £100, for something like Blue Ribbon Darts!! Companies are often able to haggle - even if it might not seem so at first.

Oh yes, Some companies can get a bit daft when quoting payments. I hear tell that Atari once asked Derek Fern for £1000 for four titles. Needless to say, Derek told them where to go!

DEALING WITH PROGRAMMERS

Programmers and developers are those responsible for producing the software that people like US Gold, Lucasfilm and Domark have written for the Atari in the past.

In the past, programmers have usually had to relinquish all copyrights to the publisher. Some, However, have insisted on clauses in their contracts that return the copyright of their creations back to them once they are no longer being sold.

One case that I know where this has happened is with a couple of games now being re-published by Richard Gore. MouseKattack and Jawbreaker are old games (the re-releases are slightly modified) previously sold by Sierra-on-Line. Of course, Sierra have not produced any Atari 8-bit software for a few years, but the programmer of these two titles had the foresight to insist that he became the sole copyright owner once Sierra had no further need of the software.

Approaching the programmers of a piece of software is fraught with copyright pitfalls... Especially if you're not sure who owns the copyright, so be careful.

DEFUNCT COMPANIES

Now we come to the most awkward part of the UK's copyright laws. When a company ceases to trade, several things may happen...

1, The receivers/liquidators may hold on to the copyrights of any products. In this case, you should track down the receivers. If the receivers haven't kept the copyrights, it may well be that they have been offered to the company's creditors.

2. The copyright reverts back to the programmers, or it may well be that the programmers had full copyright anyway (the latter is more applicable to today's working practises).

COPYRIGHT LAW

COPYRIGHTS continued

3. The worst case senario - the company has gone and taken the copyrights with it. At the moment, I have not yet found a suitable way of getting hold of these long-gone copyrights. So it seems that a lot of decent software is gone forever...

..... Unless you know better?

GERMAN SOFTWARE REVIEW.

Hello from Germany. In this issue I will give you a brief outline about some games. Lets start now:
HERBERT I. Herbert is a little duck whose girlfriend has been kidnapped by the evil Grotesko. You (as Herbert) must rescue her, you must pass many dangers in a range of landscapes e.g. castles, meadows, forests etc. the sound and graphics are very good. This game can be played by one or two players, on the two player game the screen is split in half the second players duck is called Oscar. I think this is the best game from Germany, and is a must to own it.

The second game is Herbert II, much the same as Herbert I but with new landscapes, graphics and sound, I think it is excellent.

Herbert I : 19:80 Dm (KE-Soft)
Herbert II: 19:80 Dm (KE-Soft)

The third game is DRAG (KE-Soft). Drags are creatures like frogs, which collect diamonds, you are a Drag and must avoid falling stones, bombs, which will kill you. This game is much like boulderdash, but not as good. The graphics and sound are OKay but not great.

Drag : 10,- Dm (KE-Soft)

Well thats all the reviews for the moment I hope you like them, see you next time.

By

Robert Kern.

PARALLEL BUS

Conclusion of the PBI series.

In the last issue, we looked at a design for a serial I/O device using a readily available USART chip. In this issue we'll design address decoding logic for the device and see how to add a status register and an interrupt register to it. We'll also look at some example software for the device ROM. But first, a little about last Month's design.

This USART design is a simplest case design. Writing to any address in the $D100-$D1FF range puts a character into the transmit buffer and it will be sent out the serial I/O line. Reading any address in the same range gets the last received character from the receive buffer.

The easiest way to test this arrangement is to tie the serial imput and output lines (USART pins 20 and 25) together. If you write a character to the transmit buffer and wait a few milliseconds, you should be able to read the same character from the receive buffer. All this assumes that we're decoding addresses and that we have some software in ROM. So let's get on with those details.

ADDRESS DECODER.

Figure 1 is a scematic diagram of an address decoder to provide ROM selection and device register selection.

The output signal $D8XX-$1DFXX, combined with the device select signal (1DEVSEL), provides the main Pack Disable signal (MPD) to disable the Floating point ROM in the CPU so it doesn't contend with our ROM for the data bus. We can use the same signal to select our ROM this allows us to remove some of the logic from the last issue's circuit. Just remove the wires from IC4 pins 6, 5, 4, 13, 12 and 1 and connect MPD to ROM pin 20, (see last issue's figure 2).

The signal $D1FF Selects the Device Enable Latch. When a write signal clocks the 74HCT74 latch, the value of the Data 0 line (D0) will be stored.

PARALLEL BUS continued

Writing 1 to address $D1FF selects our external device. Writing 0 deselects it. $D1FF can also be used later to select an interrupt register.

By combining it with DEVSEL and $D1XX, we get a Device Register Enable signal (DRE). We'll use this signal instead of part of the logic in last issue's circuit to make the device register work. Just remove the wires from IC4 pins 3, 2, and 1, and connect DRST to IC4 pin 13.

The CPU External Enable signal (EXTENB) lets our device know the computer wants to talk to device registers (or RAM in a more complex application). That signal is combined with DEVSEL and $D1XX to make an External Select signal (extSEL) to turn off CPU RAM so as to avoid bus contention.

DEVICE RESET

The Device Reset signal (DRST) the last issue's circuit and resets the device select latch any time the CPU generates a RESET signal.

You've probably noticed that this issue's schematics are a little different from the last issue. Since the last issue's circuit is the basic recipe for our device, we included IC location assignments and pin numbers.

This issue's article deals with several options you might or might not use, so we're giving you IC type numbers and no pin assignments for general logic functions. The number inside or next to a symbol is its type number. For example, 00 means 74HCT00.

Since all the logic is 74HCT series, we just need to use the last digits of the type number to identify a part. Also, be aware that we both positive and negative names for some signals. R/W and R/W are complementary signals and mixing them up won't work.

It would be nice to have a status register. That way, we could tell the state of our USART by asking it, rather than just hoping the byte we gave it got sent, or assuming the byte we got from it is a good one. The USART does have a status word available, four bits to read and a reset bit to write to.

The read bits are three error bits: Over-Run (OR), Framing Error (FE) and Parity Error (PE), and a Transmit Buffer Empty bit (TBE). The write bit is a Reset Data Available bit (RkDAV). The last issue's signal name list explains these bit's functions.

In order to use this new register, we need to expand our addressing capability. Figure 2 shows a way to use the address 0 line to select even and odd addresses in the device register space.

STATUS REGISTER

Figure 3 shows an implementation of the status register. The 74HCT244 shown is a tri-state buffer. This allows us to read the status bits when we select any odd address in the device register space. The gate to the USART RDAV pin reads the data available flip-flop when we write anything to an odd address.

The IRQ line is there in case you want to design in an interupt register. We're assuming that we want to generate an interupt when we get a Data Available signal from the USART.

Figure 4 uses a 74HCT244 to make an interupt register. This allows the OS interupt handler to poll our parallel bus device to see who made an interupt request. By putting the IRQ signal on the Data 0 line, we have established our USART device as device 0.

Putting the signal on the Data 1 line would make it device 1, Data 3 makes it device 3, etc. What ever bit you use here must correspond to the bit you use for the Enable Latch (figure 1). The remaining bits must be tied to 0 (ground). Remember that we've designed this circuit to be the only external device on the parallel bus. If you were to put several devices on the bus, things would get much more complex. Designing a multiple board system is

PARALLEL BUS continued

beyond the scope of this article.

But if you're a serious hardware hacker, you can probable extend what we've done here for more than one function. You should also realise that the logic in this design can be streamlined in several places. We aimed for use of only a few IC types, and haven't always optimized for speed or elegance. Sometimes we do things like use a NOR and an inverter to make an OR gate. Bulky, but workable.

YOUR SOFTWARE

Now for software. The only realy awkward thing here is that you've got to have access to an EPROM programmer for 2716's, I used a cranky home made programmer a friend put together. Some large user groups have at least one member with access to one, so you might try there.

The important part of the ROM is the vector table. You can put all your device driver routines on disk and load them as an AUTORUN.SYS file if you want, but the vector table MUST be in ROM. You can also put your device drivers in ROM if you want.

For our example, we are only implementing INIT, PUT, GET, and STATUS. For simplicity, we're making the drivers contiguous with the ROM vector table to run entirely from ROM.

The drivers in listing 1 were written using MAC/65. The source code will also assemble using the Atari Assembler Editor cartridge.

The drivers are thoroughly commented so it should be easy for you to see how they work. Notice that we reset the CRITIC flag at the beginning of each driver routine. The generic handler sets it in advance in case a parallel device is extremely time critical. Forgetting to reset CRITIC defeats some OS functions such as software counter timers and key repeat among others. The rest of the code is very straightforward.

Using these basic ideas with some ingenuity, you should be able to design your own parallel devices for your 800XL computer. If you dream up an interesting project, we at TWAUG would like to hear about it.

That concludes our series on the parallel bus, we hope that it may help someone come up with a new idea for it's use.

BUY, SALE, CONTACT SECTION

FOR SALE.

SUPRA Atari modem £15, Atari XM301 modem £15, Alternate Reality the city £10, Alternate Reality the dungeon £10, Barnyard Blaster (cartridge) £15, Miniature Golf £5, HitchHiker's guide to the Galaxy £15, Transdisk IV £15, Assembler Editor cartridge + book & disk £15, Macro Assembler £15, Chess Master 2000 £10.
All are originals and in excelent condition.

Write to: Nir Darey,
P.O. Box 6002, ACCO, 24720, Israel.

FOR SALE

1027 printer complete with PSU, manual and also includes the 1027 field service manual. Recently checked over and had new printer head fitted so is in perfect working order. £25 plus £5 postage and packing.
Phone Gordon on 0482/856179.

FOR SALE

TWAUG has still a few copies of the SWIFT Spreadsheet for the Atari XL/XE complete with manual left for sale, Price £8.95 plus £1.00 post and package.

DTP CHECKLIST

by Ed Hall

A few weeks ago I finished an article on desktop publishing (DTP) for Atari Classics. After I sent it off, I realized there was something else I wanted to do. The variety of DTP programs is astonishing, and I always had trouble remembering what each one could do, and could not do. So I decided to make up a few reference sheets to assist my faulty memory. But before we get to them, a few disclaimers.

First of all, my list is not exhaustive; it does not include Publishing Pro (Reeve Software), Page Marshall (Valar Software), or The Works (Tom Hunt). There may also be others I'm not aware of.

The "Banner" heading requires an explanation. By banner, I'm referring to a headline which stretches across the full width of a page. My listing grants a banner capability to any program which gives the user unimpeded access to the full width of the page.

"Leading" refers to the space between lines of text. "Y" means a program can adjust this space.

"PS Icons" refers to the ability to use Print Shop Icons. Actually, all the listed programs can use PS Icons after they have been converted, and there are many utilities which perform this task. However, a "Y" here means the program comes equipped with this ability, or with a utility to do the conversion.

All Atari DTP programs work in graphics 8 for maximum resolution, and nearly all can load in standard 62-sector graphics 8 and Micro-Painter screens. However, most Micro-Painter screens won't look very good unless you modify them in advance.

Finally, a word about 80-column fonts. You'll see that some programs have this feature, others don't. I've mentioned this merely for completeness, not because it's an important feature. Those programs which divide the page vertically (e.g. Newsroom, News Station, Digital Editor) don't really need an 80-column font because, by placing two 40-column screens side-by-side, they achieve the same effect. An 80-column font is important only where a program does not divide the page vertically (e.g. Antic Publisher, Page Designer). To complicate things further, one such program (Page Editor), uses its 80-column font as a screen font; that is, it is there only as a sort of visual aid.

As you see from my checklist, the multiplicity of approaches and features of Atari DTP programs is large and fascinating. My favourites are News Station and Page Editor. Both are full-featured DTP programs with quite different approaches and capabilities. Two other favourites are Page Layout and High-Resolution Dump. Though they have no text or graphics handling abilities, they are superb printing programs designed especially for DTP.

But don't expect one program to do it all. Mix and match. Even those programs which are relatively simple (like Antic Publisher and Page Designer) have their uses. Experiment and enjoy.

DESKTOP PUBLISHING continued

A. TEXT HANDLING CAPABILITY

	Editor	Fonts	Loads Text from WP
ANTIC PUBLISHER Nadav Gur Antic 12/87	Y crude	-6 non-standard fonts (including Hebrew & 80-col.) -sizes: 1 -font editor	N
DIGITAL EDITOR 3.6 Tom D'Ambrosio PD 1990	Y	-9-sector fonts -80-col. font -sizes: 2 -control chars.	Y 22 lines per file
HIGH-RESOLUTION DUMP Klaus Pruegel PD 1987	N	n/a	N
NEWSROOM Springboard Software 1987	Y -wordwrap -block move, copy, delete -set left margin	-3 non-standard fonts -sizes: 2	N
NEWS STATION Reeve Software 1986	Y -leading -set left margin	-9-sector fonts -inverse & control chars. -sizes: 8W x 8H	Y 20 lines per file
PAGE DESIGNER Xlent Software 1985	Y -leading	-9-sector fonts -80-col. font -borders font -inverse & control chars. -sizes: 1	N
PAGE EDITOR 3.3 Alan Kirk PD 1992	Y -wordwrap -right justify -set all magins	-9-sector fonts -sizes: 3W x 8H -80-col. font	Y -text file of any size may be used -specify 1-3 cols.
PAGE LAYOUT John McGowan AIM May 1993	N	n/a	N
TYPESETTER Xlent Software 1985	Y -leading -rotate chars. -set left/right margins -change typing direction	-9-sector fonts -inverse & control chars. -international font -borders font -sizes: 4W x 8H -130 version: italicize & "slice" text	N

DESKTOP PUBLISHING continued

B. GRAPHICS HANDLING CAPABILITY

	Graphics Editor	Clipart	PS Icons	Pix Gr.8	Pix MP	Banner	Device
ANTIC PUBLISHER	Y draw, inverse	N	N	Y	Y	Y	Joy
DIGITAL EDITOR	Y draw, line, circle, oval points, text fonts, copy mirror, zoom 1 fill	Y .PHO use with text editor, not graphics editor	N	Y	Y	N	Joy
HIGH-RES DUMP	N	n/a	n/a	Y	Y	N	n/a
NEWSROOM	Y draw, line circle, box rubberband mirror, zoom text, undo 10 brushes 10 fills	Y	N	N	N	Y	Joy
NEWS STATION	Y draw	N	Y 3 sizes, loads direct from PS disk	Y loads only top 5/6ths of pix	Y	N	Joy, Koala, Anim. Stat.
PAGE DESIGNER	Y draw, circle line, sphere 3 brushes	Y .PAD	N	Y	Y utility converts compres-sed pix	Y	Joy
PAGE EDITOR	Y draw, line circle	Y .ART inverse height 2x copy, move mirror, fill	Y utility converts icons to clipart	Y	Y	Y	Joy
PAGE LAYOUT	N	n/a	N	Y	Y	Y	n/a
TYPE-SETTER	draw, line circle, sphere 3 brushes 6 fills	Y .PAD	N	Y loads pix in 2 sizes: normal & expanded	Y	Y	Joy 130 ver: Koala & T.Tablet

DESKTOP PUBLISHING continued

C. PRINTING CAPABILITY

	Screens per Page	Prints Inverse	Prints Page in 1 Pass	File Formats
ANTIC PUBLISHER	2	Y	N	-saves/prints 62-sector gr.8 screens
DIGITAL EDITOR uses modified version of Billboard	4	Y	N	-text editor saves screens as 59-sector .PGE files -utility converts .PGE files to 62-sector gr.8 screens for use with gr. editor & for printing
HIGH-RES DUMP	8 holds all pix in memory	Y	Y	-saves/prints 62-sector gr.8 screens
NEWSROOM	letter 7-8 legal 9-10	N	Y	-uses non-standard formats
NEWS STATION	8	N	Y	-saves/prints 52-sector .NST "plate" -save print empty plate if page requires blank space
PAGE DESIGNER	2	N	Y	-saves screen as 116-sector file
PAGE EDITOR	4	N	Y	-saves/prints 75-sector "panel"
PAGE LAYOUT	4-8 any screen may be expanded to banner	Y	Y	-prints 62-sector gr.8 and MP pix
TYPE-SETTER ver.65 ver.130	1 2	Y if full height (normal or sideways) selected N if half-height selected		-loads 116-sector Page Designer files -ver.65 saves screen as 220-sector file -ver.130 saves screen as 259-sector file

DESKTOP PUBLISHING continued

D. MISCELLANEOUS

	Language	Noteworthy Features	Limitations
ANTIC PUBLISHER	Basic also works with TB	-large fonts good for banners -dropdown menus	-extremely crude text/graphics editor
DIGITAL EDITOR	TB CTB	-easy positioning of clipart with joystick -can also be used to make diskmag	-files created with text editor include one blank line at top of each screen -to print more than one screen per page, you must roll back paper (try Hi-Res Dump or Page Layout instead) -Break key not disabled
HIGH-RES DUMP	TB	-user friendly	-requires 130XE or XL with expanded memory
NEWSROOM	Basic	-great clipart -good manual -pretty interface	-sluggish text editor -combining text and graphics unnecessarily complicated
NEWS STATION	ML	-loads PS icons direct from disk	-creating a banner is laborious
PAGE DESIGNER	ML	-XLent suggests using Page Designer screens as layout guides for Typesetter	-80-col. text looks crude when printed out
PAGE EDITOR	TB	-automatic loading of any size text file into panels -can save all 4 panels to ramdisk and call each one up instantly	-Break key not disabled -program crashes or locks up occasionally -3-col. format used by text-loading utility does not create cols. of equal width
PAGE LAYOUT	TB	-any screen can be used as a banner -prints faster than Hi-Res Dump	-have to make minor adjustments to code to make banner -user interface could be improved -disk constantly accessed during printing
TYPE-SETTER	ML	-some unique text-handling abilities -useful supporting software including Xlent's Rubber Stamp, and 3rd party font, icon & layout disks	-small view of total page makes work tedious (program uses scrolling window over large virtual page similar to spreadsheet) -drivers for graphics tablets extremely crude

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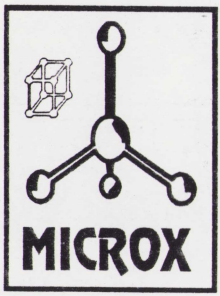

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PHOENIX.

The new disk based news letter from Ireland, produced by Robert Paden.
Robert recently had to give up producing the I.A.U newsletter after four issues because of lack of support.

PHOENIX will be a double sided disk, side 'A' will be packed full of text files containing Articles, reviews and much much more. Side 'B' will contain a good selection of PD software.
The first 6 issues will be available from either TWAUG, or from New Atari User PD libraries at £2.50 per issue.

If PHOENIX proves to be a success (which we hope it will), then from issue 7, it will only be available from Robert Paden himself.

CURRENT NOTES

Helping Atari Owners Through the World of Computing.

Current Notes is published monthly (excluding January and August), in the U.S.

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Editor's Note:
We at TWAUG are receiving the CN magazine monthly and we are always looking forward to it.

NEW ATARI USER PAGE 6

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THE OL'HACKERS ATARI USER GROUP INC.

O.H.A.U.G. is an all 8-bit user group in the State of New York, they are producing a bi-monthly first class informative newsletter on disk.

The disk is double sided full of news, views, articles and bonus games and/or utilities. The disk has its own printing utility which you can use to read the content of the disk on screen or make hard copies.

A large PD Library is also available.

Some of the T.W.A.U.G. members are contributing to the OL'Hackers newsletter and the OL'Hackers are contributing to the T.W.A.U.G. missive.

We are sorry to inform you that membership role has now been closed and no new non-local members can be accepted. The President:

A. Pignato
O.H.A.U.G.
3376 Ocean Harbor Drive
Oceanside, N.Y.11572
U.S.A.

ULTIFONT

ULTIFONT has been written exclusively for T.W.A.U.G... and it is only available from our library, for £4.95.

It is one of the most powerful character set editor written for the Atari. It fully supports the Atari 4-colour text modes and allows you to edit two adjacent characters as one. In addition, you may edit 2 different fonts at once and easily work between them.

It is totally joystick-driven, so you can sit back and relax, rather than hunching over the keyboard. ULTIFONT requires a colour display and 48K of memory.

Printed instructions come with the single sided disk.